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COMPARING ACTUAL TIMBER GROWTH WITH POTENTIAL: SOME IMPLICATIONS FOR MONTANA

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ABSTRACT

Comparing actual timber growth (production) with potential can serve as a benchmark for monitoring management efforts or direction. In 1970, the estimated gross growth on Montana's 16 million acres of forest land classified as commercial for timber production was 607 million cubic feet. Assuming management could have been intensified, especially on the more productive acres, production could have been increased substantially on this area; or, the 1970 level of growth could have been obtained from considerably less area.

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Most foresters agree that greater timber production is possible through intensified timber management. Increasing demand for timber production in the face of increasing demand for nontimber use of forest land emphasizes the need to initiate and continue intensive management--prompt regeneration of nonstocked acres and adequate stocking control. Comparing actual growth with potential wood production provides a guide to what might be achieved.

The comparison presented here bases potential production estimates on the "peak" mean increment of wood added annually in fully stocked stands. The comparison also assumes that, under management, trees can be grown through the rotation to the planned harvest time at the peak rate.

Using data from Montana, this report contrasts actual with potential timber production by site productivity classes (USDA Forest Service 1967).

Site productivity class	*Potential wood production* *ft³/acre/yr*
I	165+
II	120-164
III	85-119
IV	50-84
V	20-49

Growth data by productivity classes are available for only a portion of Montana and are for 1970. The data represent about 2.8 million of the 16 million acres of commercial forest land in the State (fig. 1). These 2.8 million acres were producing about 190 million cubic feet of wood in 1970. If the total acreage was devoted to intensive timber production (full and controlled stocking) the 2.8 million acres theoretically could produce nearly 270 million cubic feet per year.

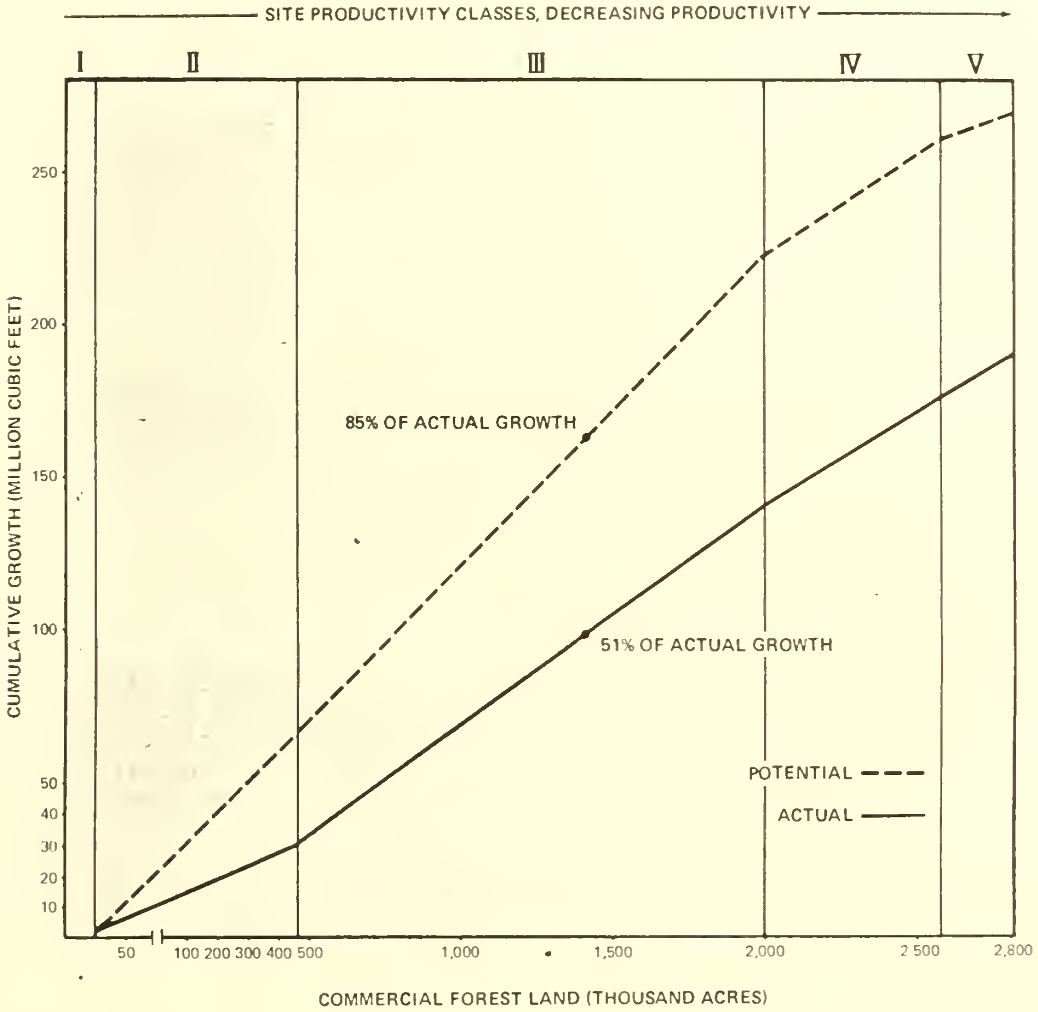

Figure 1.--Estimated actual and potential timber growth on 2.8 million acres of commercial forest land in Montana, 1970. The shaded portion represents the most productive half of the area.

The illustrated comparison of actual and potential growth for the 2.8 million acres suggests that:

1.--The more productive half of the area, about 1.4 million acres, accounted for little more than half of the 2.8-million-acre area's timber growth in 1970.

2.--The more productive half of the area, producing at its potential, might contribute 85 percent of the total area's annual timber growth.

3.--The 2.8-million-acre area's production could be obtained from approximately 1.65 million of the most productive acres if potential could be achieved. For example, if potential productivity could be reached on productivity classes I and II land only, volume would increase almost 37 million cubic feet annually.

4.--Growth on the area could be increased about 80 million cubic feet annually if potential productivity could be achieved on all acres.

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In 1970, about 16 million acres of forest land in Montana was classified as commercial timber producing land. The estimated annual gross growth was 607 million cubic feet (Green and Setzer 1974). The estimated potential productivity of this land is 1,165 million cubic feet of wood per year.

Figure 2 depicts estimated actual and potential growth for Montana's commercial forest land. Because growth data by productivity classes are not available for all of Montana, acreages in the site productivity classes for the State (fig. 2) were initially assigned the same current growth per acre as the classes in figure 1. Resulting growth totals for classes were adjusted proportionally by means of the ratio between grand total growth for all classes and the 1970 estimate of current growth for the State. This illustration suggests that:

1.--Current productivity is well below potential productivity.

2.--Timber production could be maintained at present levels on considerably less area, providing these acres were producing at potential.

3.--Timber production might be increased by as much as 92 percent on the 1970 commercial forest land if management could be intensified to the theoretical maximum.

This analysis, though limited to the physical possibilities of wood production, could serve as a benchmark for monitoring management efforts or direction. Of course, other considerations are important. These include (1) the cost and rate of return of achieving potential production; (2) the effects of not managing low-productivity forest land supporting insect-infested or diseased stands; and (3) the necessity of accommodating nontimber use on some commercial timberland.

The comparison confirms opinions expressed by many foresters that intensified timber management on the more productive acres can increase growth to meet present and future needs for wood. It is physically possible to increase wood yields on present commercial forest land, or to produce present yields on fewer acres if prompt regeneration is achieved and stocking control is maintained.

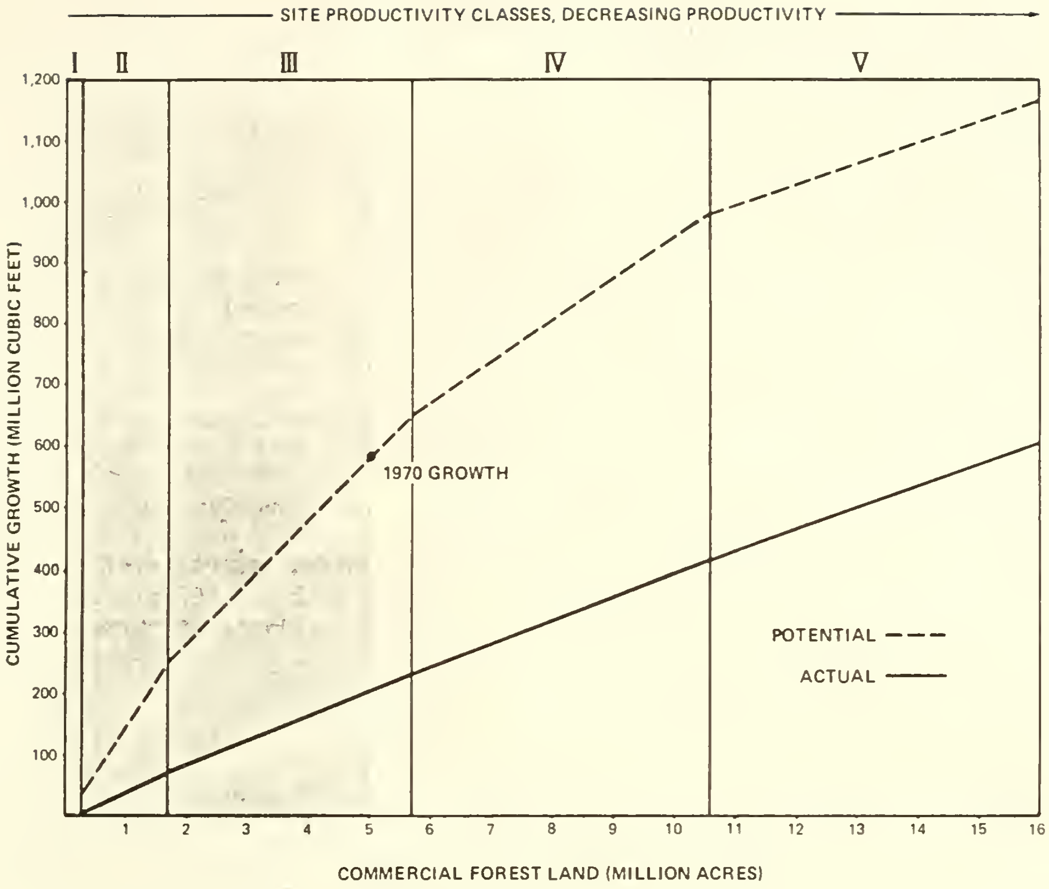

Figure 2.--Estimated actual and potential timber growth on Montana's approximate 16 million acres of commercial forest land. The shaded portion represents the acreage which theoretically could produce 1970's 607 million cubic feet, gross growth.

LITERATURE CITED

Green, Alan W., and Theodore S. Setzer.
1974. The Rocky Mountain forest situation, 1970. USDA For. Serv. Resour. Bull. INT-10, 78 p. (Intermt. For. and Range Exp. Stn., Ogden, Utah.)

USDA Forest Service.
1967. Forest survey handbook, 4809.11: 48.2, Site class. Washington, D.C.

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